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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARSHALL R. MOORE

Appeal 2008-5437
Application 09/682,168
Technology Center 3700

Decided: December 1, 2008

Before JAMES T. MOORE, *Vice-Chief Administrative Patent Judge* and
JAMESON LEE and SALLY G. LANE, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is a decision on appeal by an Appellant under 35 U.S.C. § 134(a) from a final rejection of claims 1 and 6-13. The Appellant requests reversal of the Examiner's rejection of those claims. We have jurisdiction under 35 U.S.C. § 6(b).

References Relied on by the Examiner

McGarvey	5,285,920	Feb. 15, 1994
Hall	5,601,204	Feb. 11, 1997
Keehan	6,267,069	Jul. 31, 2001

The Rejections on Appeal

The Examiner rejected claims 1 and 6-13 under 35 U.S.C. § 103(a) as unpatentable over Hall, McGarvey, and Keehan.

The Invention

The invention relates to an insulated fuel tank having fire protection qualities. (Spec. ¶2.)

Independent claim 1 is reproduced below (Claims App'x 1:1-9):

1. An aboveground storage tank for flammable and combustible liquids having secondary containment capability, comprising:

an inner primary tank formed of steel for storing the liquid;

an outer secondary tank formed of steel encasing said inner primary tank defining an interstitial space therebetween;

an insulating foam material disposed in the interstitial space; and

a fire resistant polymer material sandwiched between the insulating foam material and the outer secondary tank so that a fire resistant composite including said insulating foam material and said fire resistant polymer material encases the inner primary tank.

B. ISSUES

Did the Examiner err in finding that a person of ordinary skill in the art would have known to arrange a layer of fire resistant polymer between a layer of insulating foam and an outer wall of a storage tank?

C. FINDINGS OF FACT

1. Hall discloses a tank vault 10 for the above-ground storage of liquid fuels. (Hall 2:21-24.)

2. In Hall, the tank vault 10 includes an inner tank 12 and outer shell 20 with an interstitial space that is filled with a “suitable insulating material.” (Hall 6:66 to 7:1.)

3. In Hall, the insulating material includes materials that provide both an insulating function and a heat-resisting function. (Hall 7:2-5.)

4. Hall expressly teaches that the space “may be varied and filled with several different insulating materials within the teaching of this invention.” (Hall 7:29-31.)

5. Keehan discloses storage tanks for liquid chemicals. (Keehan 1:14-18.)

6. In Keehan, the tanks have a double wall structure with “insulative qualities” such that a tank with hot cargo may be placed next to a tank with cold cargo. (Keehan 7:33-38.)

7. In one embodiment of Keehan, storage tank 70 includes an inner wall 90 and an outer wall 98. (Keehan Figure 9.)

8. Keehan's Figure 9 is reproduced below:

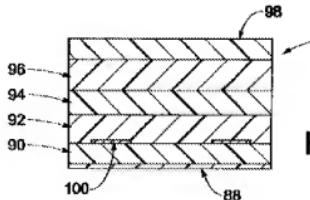


FIG. 9

Figure 9 shows a cross-section of a storage tank.

9. As shown in Keehan's Figure 9, three layers 92, 94, and 96 lie in the space between inner wall 90 and outer wall 98.

10. Keehan discloses that layer 92 is a layer of energy absorption material that is formed from high-density foam. (Keehan 8:61-64.)

11. Keehan discloses layer 94 as an organic or inorganic polymer (Keehan 9:24-26) which is made fire-resistant. (Keehan 10:8-15.)

12. In Keehan, each of polymer layer 94 and layer 96 are "sandwiched" between foam layer 92 and outer wall 98. (Keehan Figure 9.)

13. Keehan teaches that its arrangement of insulating materials between the inner and outer walls of a tank produces a sandwiched sidewall construction that is high strength, light weight, and fire resistant. (Keehan 8:65 to 9:1; 10:8-15.)

D. PRINCIPLES OF LAW

A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

KS Int'l Co. v. Teleflex Inc., 127 S.Ct. 1727, 1739 (2007).

If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at 1740.

The test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

E. ANALYSIS

The Examiner rejected claims 1 and 6-13 as unpatentable over Hall, McGarvey, and Keehan. The Appellant argues claims 1 and 6-13 collectively. Claim 1 is representative. We focus on the disputed limitations.

The Appellant disputes that the prior art satisfies the requirement in claim 1 of a fuel storage tank having four specific layers of materials arranged in the following order from the inside to the outside of the storage tank: 1) an inner steel tank; 2) an insulating foam material; 3) a fire resistant polymer material; and 4) an outer steel tank. (Ans. 3-12.)

The Examiner found that Hall teaches a fuel storage tank having and an inner steel tank 12 and an outer steel tank 20 with an interstitial space that is filled with insulating materials. (Ans. 4:4-16.) The Examiner determined that Hall lacks the specific arrangement of insulating materials that satisfy the claim requirement of “a fire resistant polymer material sandwiched between the insulating foam material and the outer secondary tank.” To remedy the deficiency, the Examiner pointed to each of McGarvey and Keehan as teaching fuel tanks with a foam insulating layer and a fire resistant layer. (Ans. 4:17-19; 5:7-9.)

Hall discloses a tank vault 10 for the above-ground storage of liquid fuels. (Hall 2:21-24.) In Hall, that tank vault 10 includes an inner steel tank 12 and outer steel shell 20 with an interstitial space that is filled with a “suitable insulating material.” (Hall 6:66 to 7:1.) That suitable insulating material includes materials that provide both an insulating function and a heat-resisting function. (Hall 7:2-2-5.) Hall expressly teaches that the space “may be varied and filled with several different insulating materials within the teaching of this invention.” (Hall 7:29-31.)

Keehan discloses storage tanks for liquid chemicals. (Keehan 1:14-18.) In Keehan, the tanks have a double wall structure with “insulative qualities” such that a tank with hot cargo may be placed next to a tank with cold cargo. (Keehan 7:33-38.) In one embodiment, storage tank 70 includes an inner wall 90 and an outer wall 98. (Keehan Figure 9.)

Keehan’s Figure 9 is reproduced below:

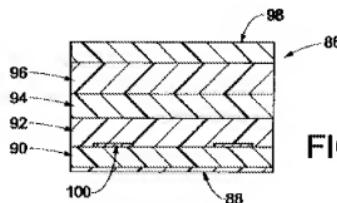


FIG. 9

Figure 9 shows a cross-section of a storage tank.

As shown in Figure 9, three layers 92, 94, and 96 from insulating materials which lie in the space between inner wall 90 and outer wall 98. Keehan discloses that layer 92 is a layer of energy absorption material that is formed from high-density foam. (Keehan 8:61-64.) Keehan discloses that layer 94 is an organic or inorganic polymer (Keehan 9:24-26) which is made

fire-resistant. (Keehan 10:8-15.) Layer 92 satisfies the claim requirement of “an insulating foam material.” Layer 94 satisfies the requirement of “a fire resistant polymer material.”

A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *KSR*, 127 S. Ct. at 1739. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at 1740. Further, the test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d at 425.

Here, Hall expressly provides that a variety of different insulating materials may fill the space between inner tank 12 and outer shell 20. (Hall 7:26-31.) In Keehan, insulating materials 92, 94, 96 located between its inner and outer tanks produces a sandwiched sidewall construction having high strength, light weight, and fire resistance. (Keehan 8:65 to 9:1; 10:8-15.) In light of the combined teachings of Hall and Keehan, a person of ordinary skill in the art would reasonably have used Keehan’s known insulating materials 92, 94, 96 to fill the space between Hall’s inner tank 12 and outer shell 20 to obtain insulated storage tank walls with the above-noted benefits.

Furthermore, as shown in Keehan’s Figure 9, the fire resistant polymer layer 94 is arranged between the insulating foam layer 92 and the outer wall 98. Although there is an additional layer 96 that resides between polymer layer 94 and outer wall 98, that layer 96 does not preclude polymer

layer 94 from being considered “sandwiched” between foam layer 92 and outer wall 98. The Appellant’s claim 1 is not so narrow as to prohibit the fire resistant polymer material from being “sandwiched” along with layers of other material. In Keehan, each of polymer layer 94 and layer 96 are “sandwiched” between foam layer 92 and outer wall 98. Keehan satisfies that requirement of “a fire resistant polymer material sandwiched between the insulating foam material and the outer secondary tank.”

The combination of Hall and Keehan satisfies the claimed type and order of storage tank materials.

The Examiner also pointed to McGarvey as additional evidence in the storage tank art of the use of foam insulating materials and fire-resistant layers. For the reasons discussed above, Hall and Keehan account for all the limitations of claim 1. We need not address the disclosure of McGarvey.

For all the foregoing reasons, we sustain the rejection of claims 1 and 6-13 under 35 U.S.C. § 103(a) as unpatentable over Hall, McGarvey, and Keehan.

F. CONCLUSION

We conclude that the Examiner did not err in finding that a person of ordinary skill in art would have known to arrange a layer of fire resistant polymer between a layer of insulating foam and an outer wall of a storage tank, and, as a consequence, in concluding that the subject matter of claim 1 would have been obvious.

G. ORDER

The rejection of claims 1 and 6-13 under 35 U.S.C. § 103(a) as unpatentable over Hall, McGarvey, and Keehan is **affirmed**.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

rvb

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